LINESHAPE STUDY OF THE J=3-2 ROTATIONAL TRANSITION OF CO PERTURBED BY N_2 AND O_2

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We report on the collisional relaxation of the J=3-2 rotational line of CO induced by nitrogen and oxygen. Measurements have been made by using a millimeter wave video-type spectrometer at several temperatures between 240 and 400K. In the 20-400 mTorr pressure range investigated, significant deviations from the Voigt profile have been observed. The observed lineshapes have been studied by means of a quasi-analytical speed dependent Galatry profile. This allows to point out a correlation between the parameters describing the speed dependence of relaxation and the molecular diffusion. The retrieved collisional relaxation coefficients and their temperature dependence both favourably compare to previous reported measurements. Theoretical results obtained from the Robert-Bonamy collisional formalism and from the brownian motion theory allows to consider the possible origins of observed lineshapes.